

Editorial Note: An Introduction to the EQPAM Special Issue on Legal Requirements for Complex Sociotechnical Systems

Velicogna, Marco; Schmidt, Aernout H.J.

Veröffentlichungsversion / Published Version
Zeitschriftenartikel / journal article

Empfohlene Zitierung / Suggested Citation:

Velicogna, M., & Schmidt, A. H. (2019). Editorial Note: An Introduction to the EQPAM Special Issue on Legal Requirements for Complex Sociotechnical Systems. *European Quarterly of Political Attitudes and Mentalities*, 8(2), 1-6.
<https://nbn-resolving.org/urn:nbn:de:0168-ssoar-62438-8>

Nutzungsbedingungen:

Dieser Text wird unter einer CC BY-NC-ND Lizenz (Namensnennung-Nicht-kommerziell-Keine Bearbeitung) zur Verfügung gestellt. Nähere Auskünfte zu den CC-Lizenzen finden Sie hier:
<https://creativecommons.org/licenses/by-nc-nd/4.0/deed.de>

Terms of use:

This document is made available under a CC BY-NC-ND Licence (Attribution-Non Commercial-NoDerivatives). For more information see:
<https://creativecommons.org/licenses/by-nc-nd/4.0>

Editorial Note

EQPAM Special Issue on Legal Requirements for Complex Sociotechnical Systems

Guest Editors

Marco Velicogna

Research Institute on Judicial Systems
National Research Council
Italy

Aernout H.J. Schmidt

Leiden University Law School
The Netherlands

Date of submission: April 23rd, 2019

Date of acceptance: April 23rd, 2019

An Introduction to the EQPAM Special Issue on Legal Requirements for Complex Sociotechnical Systems

This Special Issue of the European Quarterly of Political Attitudes and Mentalities (EQPAM) presents a collection of papers contributing to the understanding of the increasingly relevant topic of legal requirements analysis and engineering in complex sociotechnical contexts, with an eye to the complex intertwining between law and technological systems development and implementation for the public service provision.



This work is licensed under a [Creative Commons Attribution-NonCommercial-NoDerivatives 4.0 International License](https://creativecommons.org/licenses/by-nc-nd/4.0/).

Corresponding Author: Marco Velicogna, Ph.D., Researcher

Affiliation: Research Institute on Judicial Systems of the National Research Council of Italy.

Address: Via Zamboni 26, Bologna – 40126, Italy

e-mail: marco.velicogna@irsig.cnr.it

Copyright © 2019, Marco Velicogna and Aernout H.J. Schmidt

European Quarterly of Political Attitudes and Mentalities - EQPAM, Volume 8, No.2, April 2019, pp. 1-6.

ISSN 2285 – 4916

ISSN-L 2285 – 4916

Information and communication technology (ICT) is increasingly becoming part of everyday life. The continuous widening of scope for ICT services has become a stable element in our thinking about scientific, administrative, economic and social issues — even to a level that propels attention to the legal aspects involved (e.g. Velicogna 2019).

In the public sector, over the last 30 years, great efforts have been made to develop and implement systems that rationalize the working processes, reduce costs and provide better services to the public. At the same time, while the potential for ICT is clearly visible, many ICT developments resulted in systems that were never delivered, became operational, or were judged not adequate and never sufficiently used. Even the successful cases often did not respect the time schedule and the foreseen budget. In other terms, “successful ICT projects for public services (governmental and judiciary) are rare indeed” (Schmidt and Zhang (2019)).

A broad body of research has explored the sociotechnical complexity at the basis of these failures. These studies have looked at the interactions, interdependencies, and mutual adaptations of the technologies being developed and implemented with other applications, platforms, infrastructures and the broader organizational context (e.g. Hanseth and Lyytinen 2010, Contini and Lanzara 2014).

At the same time, the role of the legal complexity has been underexplored. Exceptions are typical of the justice field research area, where the role of the regulations in shaping the possibilities to develop and provide technologies and services is particularly visible (Contini Cordella 2007). At the same time, the relevance of the regulative layer also outside of the legal domain is becoming increasingly visible. Changes introduced world- wide to comply with the EU GDPR regulation provide but one example (Velicogna 2019).

Applications and platforms, to perform their functions, increasingly need to be not just technically functional but legally compliant and support legally valid communication. Legal requirements are not easily investigated, as they result not just from the law but also by its interpretation and practice, which evolve over time and depend on a plurality of actors, organizations and institutions. Governance mechanisms capable of governing this complexity are being set in place at national and supranational levels through much trial and error and learning by doing.

This special issue contributes to the literature by filling the existing void and expanding knowledge in the IT field, exploring how law and technology interact, and which governance mechanisms are required for this to take place successfully.

This effort is done with the understanding that ICT and the law have proven to be uneasy bedfellows already in the 1970s with its worldwide burst of failing mega ICT projects. This became known as the *Software Crisis*, which not only unveiled the difficulties in securely contracting ICT services, it also ignited a new sub discipline in ICT science named *Requirements Engineering*, which more or less culminated in methods described in (e.g.) Wieringa (1997), Booch et al. (1998) and Beck et al. (2001).

Legal Requirements Engineering (LRE) is a concept that naturally relates to such methods. Although it is recognized in ICT science as a subdomain, it has not made it into a specialization in the legal discipline, and the meaning of the LRE concept is not yet established in a cross-disciplinary sense.

Browsing chronologically through a selection of publications we only find examples of LRE of the first kind and mention Otto and Antón (2007) who focus on methods for modeling system-behavior compliance with legal requirements, Compagna et al. (2009) who focus on methods to derive legal requirements for business ICT services from the company's goals and its organizational structure, Siena (2010) who considers in his Ph.D. thesis how the system under development can not only comply with the owner's (company's) goals but also with legal requirements, a problem which is considered “... in the hands of the requirements analysts” (p. 128) and to whom he offers a method and a toolbox, Hoffmann et al. (2012) who discuss whether legal requirements that have been interpreted by legal specialists can be reused in other modeling situations (towards a library of legal requirements interpretations based on the identification of functional software requirement patterns derived from the law — especially privacy law), Gordon (2014) who considers in his Ph.D. thesis the increased legal complexities that networked, cross-border operation of services bring and how different approaches help to reduce these complexities, without providing easy solutions however and Faßbender (2017) who, also in a Ph.D. thesis presents a well-ordered, 570 page exposition of the complexities involved in legal-compliance directed requirements engineering which is rather comprehensive yet

by no means provides generically valid and practical answers to an audience that is getting accustomed to survive with a tweet-length attention span.

From the perspective of the legal discipline, when we understand LRE as an approach to inject compliance with the law in the architectures of ICT-based services, we also see both opportunities and risks. Accordingly, in this special issue, particular interest is given to theoretical discussion and existing legal requirements analysis and engineering experiences and to cases studies showing concrete practices relating to the topic and to the problems generated by the co-evolution of regulations and ICT systems development and implementation.

The papers we present in the issue can be grouped in three categories for the contribution they give to the understanding of the topic: national experiences, cross border multilevel experiences (supranational and national), and new developments and approaches, in particular the new frontier of artificial intelligence and agent based modeling.

National experiences (Portuguese and Italian) are analyzed through different lenses posing on the one hand more attention to the institutional framework and governance, on the other to the technical and organizational development and experimentation. In “Intertwining judicial reforms and the use of ICT in courts: a brief description of the Portuguese experience”, Paula Fernando provides for a concise description of the Portuguese justice system and of the main challenges it has faced in the last decades, providing the background to understand the relation between legal reforms and e-justice development. The paper analyzes the two main courts’ information systems: CITIUS (for judicial courts) and SITAF (for administrative and tax courts) from their introduction to the measures adopted under the recent *Justiça + Próxima* reform plan, debating on the whether such measures are able to address existing problems and introduce a new era of the use of ICT at courts.

Davide Carnevali, in “A great success that was on the brink of failure: the case of a techno-legal assemblage in the “Civil Trial On-Line” system in Italy”, provides a different perspective on the analysis of a national e-Justice experience. The paper presents a detailed description of the Italian e-justice architecture and technical solutions, describing its evolution and focusing on the complexity of ‘assembling’ the technological, legal and organizational components of the system. It shows how development of complex e-justice platforms, when closely observed, reveals a very demanding processes, characterized by not linear dynamics generated by the mutual interdependence of heterogeneous (legal, technological and organizational) elements which need to be aligned. It also shows how success may be linked on unanticipated shifts of direction when everything seems to be failing, when new and previously unavailable options are explored, and when new actors enters into play changing the initial conditions and objectives.

Cross border multilevel experiences are investigated by Rosanna Amato, in “Exploring the legal requirements for cross border judicial cooperation: the case of the service of documents” which focuses on the EU legal framework regulate the cross-border service of judicial and extrajudicial documents. The paper is “a first attempt to outline the workflow of this method of transmission, so as identify the steps to be taken to perform the cross-border service and providing and overview of the main problem affecting its practical application, also in the perspective of a possible future digitisation of the procedure” giving particular attention to the channel of transmission based on transmitting and receiving agencies. In particular the paper shows how the procedure is not only influenced by local interpretation of the supra-national framework, but is also “deeply rooted in the domestic civil procedural law tradition and is strongly linked to a variety of internal factors, such as the role played by the structure of the proceeding”. The lack of familiarity with the instrument that field research evidenced just add to this complexity hindering mutual understanding and reducing the effectiveness of the instrument. As an alternative to the typical legal approach looking for a normative suggestion or the direct attempt to find a difficult technological solution, the paper suggests a third path, based on “filling normative gaps with non-legislative arrangements, which may have a positive effect on the rapid and effective conduct of the service procedure”, and may help a follow up digitization of the procedure.

They are also investigated by Alina Ontanu “Adapting Justice to Technology and Technology to Justice. A Coevolution Process to e-Justice in Cross-border Litigation”, which provides an interesting representation of the complexities of EU cross-border uniform procedures – in particular the European Order for Payment and the European Small Claims Procedure - and of the technological layer being deployed to support them. As technological deployment is explored, the requirement of the law to support the technology also emerges. The design of legal

instruments in this complex sociotechnical environment thus becomes entangled with the technological layer initially developed to support the law. The author observes how “the e-Justice Portal and the e-CODEX tests [...] reveal the difficulty of interaction between multiple legal and institutional frameworks as well as different national e-justice architectures”. Furthermore, the complexity does not lie solely in the design and development of a functional system but in the problem of its evolvability, as law and technology becomes more and more entangled and mutual adaptation over technical developments and legislative amendments is required.

The new frontier papers explore two recent developments of the interaction between law and technology in the legal domain.

With his paper on “*Regulating (Artificial) Intelligence in Justice: How Normative Frameworks Protect Citizens from the Risks Related to AI Use in the Judiciary*”, Giampiero Lupo investigates the topic of artificial intelligence in the Justice domain describing the main tools currently being developed and implemented. AI search tools, predictive technologies and business analytics based on the computation of big data are on the verge of revolutionizing the work of legal practitioners and court personnel (judges and administrative staff). Building on this, the paper tackle the potential practical and ethical issues AI use rises in the justice domain, from the users perspective but also for the parties affected by its use. It then explores existing efforts to regulate this phenomenon suggesting that a stronger form of regulation would be required. While not providing a definitive answer on how such complex sociotechnical phenomenon can be regulated, the paper offers a good contribution to the special issue reflection on the means to identify legal requirements but also the problem of designing legal mechanisms capable of supporting the satisfaction of such requirements and on some of the limits of present approaches.

Finally, Kunbei Zhang, in “*e-Justice: A Bottom-Up Venue to Promote Open Justice? A Heuristic Analysis Based on Agent-Based Modeling*”, provides an example of the possibility to apply agent based modeling to the area of e-Justice and open justice. The simplified model proposed by the author, without the pretention of generating a detailed representation of reality, builds on the seminal works of Douglas, Akerlof, Bobbitt and Shannon to present the features and the potential applicability of the design of behavioural models of communities with deliberate agent in a currently relevant area, that of e-justice development and open justice.

References

- Akerlof, G.A. (1984). *An Economic Theorist's Book of Tales: Essays that Entertain the Consequences of New Assumptions in Economic Theory*, Cambridge/London/New York: Cambridge University Press.
- Amato, R. (2019) Exploring the Legal Requirements for Cross Border Judicial Cooperation: The Case of the Service of Documents, *European Quarterly of Political Attitudes and Mentalities*, ISSN 2285-4916 ISSN-L 2285-4916, Volume 8, Issue No.2 (April 2019), pp. 21-35.
- Beck, K., M. Beedle, A. Van Bennekum, A. Cockburn, W. Cunningham, M. Fowler, J. Grenning, J. Highsmith, A. Hunt, R. Jeffries, et al. (2001). *Manifesto for Agile Software Development*.
- Bobbitt, P. (1982). *Constitutional Fate: Theory of Constitution*. New York: Oxford University Press.
- Booch, G., J. Rumbaugh, and I. Jacobson (1998). *The Unified Modeling Language User Guide*. Addison-Wesley.
- Carnevali, D. (2019) A Great Success that Was on the Brink of Failure: The Case of a Techno-Legal Assemblage in the “Civil Trial On-Line” System in Italy, *European Quarterly of Political Attitudes and Mentalities*, ISSN 2285-4916 ISSN-L 2285-4916, Volume 8, Issue No.2 (April 2019), pp. 21-35.
- Compagna, L., P. El Khoury, A. Krausová, F. Massacci, and N. Zannone (2009). How to integrate legal requirements into a requirements engineering methodology for the development of security and privacy patterns. *Artificial Intelligence and Law* 17(1), 1–30.
- Contini, F. and Lanzara, G.F. (eds.) (2014), *The Circulation of Agency in E-Justice. Interoperability and Infrastructures for European Transborder Judicial Proceedings*. Springer.
- Contini, F., & Cordella, A. (2007). Information System and Information Infrastructure Deployment: The Challenge of the Italian E-Justice Approach. *Electronic Journal of e-Government*, Volume 5 Issue 1 pp.43 - 52
- Douglas, M. (1992). *Risk and Blame – Essays in Cultural Theory*, London: Routledge.
- Faßbender, S. (2017). *Domain- and Quality-aware Requirements Engineering for Law-compliant Systems*. Ph. D. thesis, Universitätsbibliothek Duisburg-Essen.

- Fernando, P. (2019) Intertwining Judicial Reforms and the Use of ICT in Courts: A Brief Description of the Portuguese Experience, *European Quarterly of Political Attitudes and Mentalities*, ISSN 2285-4916 ISSN-L 2285-4916, Volume 8, Issue No.2 (April 2019), pp. 7-20.
- Gordon, G. (2014). *Without borders: addressing legal requirements in multi-jurisdictional IT environments*. Ph. D. thesis, Carnegie Mellon University Pittsburgh.
- Hanseth, O., & Lyytinen, K. (2010). Design theory for dynamic complexity in information infrastructures: the case of building internet. *Journal of information technology*, 25(1), 1-19.
- Hoffmann, A., T. Schulz, H. Hoffmann, S. Jandt, A. Roßnagel, and J. M. Leimeister (2012). Towards the use of software requirement patterns for legal requirements. In *2nd International Requirements Engineering Efficiency Workshop (REEW) 2012 at REFSQ 2012*, Essen.
- Lupo, G. (2019) Regulating (Artificial) Intelligence in Justice: How Normative Frameworks Protect Citizens from the Risks Related to AI Use in the Judiciary, *European Quarterly of Political Attitudes and Mentalities*, ISSN 2285-4916 ISSN-L 2285-4916, Volume 8, Issue No.2 (April 2019), pp. 75-96.
- Ontanu, E.A. (2019) Adapting Justice to Technology and Technology to Justice. A Coevolution Process to e-Justice in Cross-border Litigation, *European Quarterly of Political Attitudes and Mentalities*, ISSN 2285-4916 ISSN-L 2285-4916, Volume 8, Issue No.2 (April 2019), pp. 54-74.
- Otto, P. N. and A. I. Antón (2007). Addressing legal requirements in requirements engineering. In *15th IEEE International Requirements Engineering Conference (RE 2007)*, pp. 5–14. IEEE.
- Schmidt, A. H. and K. Zhang (2019). Agent-based modelling: A new tool for legal requirements engineering: Introduction and use case (kei). *European Quarterly of Political Attitudes and Mentalities* 8 (1), 1–21.
- Shannon, CE. (1948). A Mathematical Theory of Communication, *The Bell System Technical Journal*, Vol. 27 (3), pp.379-423.
- Siena, A. (2010). *Engineering Law-Compliant Requirements: The Nòmos Framework*. Ph. D. thesis, University of Trento.
- Velicogna, M. (2019). Building Information Infrastructures for Smart Cities: The e-CODEX Infrastructure and API for Justice Project Experiences. In Bolivar, M.P.R. (ed.) *Setting Foundations for the Creation of Public Value in Smart Cities* (pp. 197-222). Springer, Cham.
- Wieringa, R. (1997). *Requirements Engineering: Frameworks for Understanding*. Wiley.
- Zhang, K. (2019) e-Justice: A Bottom-Up Venue to Promote Open Justice? A Heuristic Analysis Based on Agent-Based Modelling, *European Quarterly of Political Attitudes and Mentalities*, ISSN 2285-4916 ISSN-L 2285-4916, Volume 8, Issue No.2 (April 2019), pp. 97-109.

Open Access

This article is distributed under the terms of the Creative Commons Attribution Noncommercial License which permits any noncommercial use, distribution, and reproduction in any medium, provided the original author(s) and source are credited.